Long Haul Optical Communication System

Abstract of the Disclosure

A high bit rate, long haul optical communication system encodes a polarization interleaved stream of RZ optical pulses using phase shift keying (PSK) or differential phase shift keying (DPSK), in contrast to conventional on-off keying (OOK). The polarization interleaved stream of RZ optical pulses can be used for PSK or DPSK encoding of either one data stream having a bit rate that is the same as the optical stream pulse rate, or two (or more) independent data streams which individually each have lower bit rates, but which, when combined, have the same rate as the optical stream pulse rate. The latter arrangement essentially accomplishes polarization multiplexing (P-MUX). Individual wavelengths can be combined in a WDM or DWDM system, wherein, at the transmitter, multiple streams of polarization interleaved pulses, each stream having a different wavelength, are combined. At the receiver, the received combined signal is wavelength division demultiplexed, and the encoded data in each wavelength channel is recovered by a PSK or DPSK receiver, which, in the DPSK example, usually consists of a delay demodulator and a balanced detector. The transmission medium and laser power may be managed, for example so that the pulse transmission comprises solitons.